

WHAT IS CLAIMED IS:

1. A diesel engine, comprising:
fuel injection timing control means for controlling fuel
5 injection timing,
wherein said fuel injection timing control means
advances the fuel injection timing by predetermined time when
an engine load becomes a predetermined load or lower in an
engine stopping step of stopping the diesel engine while
10 gradually reducing the engine load.
2. The diesel engine according to Claim 1, further
comprising:
charge air temperature detecting means for detecting
15 charge air temperature,
wherein said fuel injection timing control means
controls the fuel injection timing based on a detection signal
from said charge air temperature detecting means.
- 20 3. The diesel engine according to Claim 2, further
comprising:
reduced cylinder operation control means for stopping
fuel supply to at least one combustion chamber being one part
out of a plurality of combustion chambers when the engine load
25 becomes a predetermined load or lower during said engine

stopping step.

4. The diesel engine according to Claim 3,
wherein a fuel used comprises a water emulsion fuel.

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5. The diesel engine according to Claim 4, further
comprising:

a supercharger for pressurizing intake outside air and
supercharging it into said plurality of combustion chambers;

- 10 heat exchanging means constituted by including a first
heat exchanger for receiving a first medium to exchange heat
with charge air from an outlet of said supercharger, and a
second heat exchanger for receiving a second medium having a
higher temperature than said first medium and exchanging heat
15 with the charge air from an outlet of said first heat exchanger;
and

flow control means for controlling a flow of said second
medium flowing into said second heat exchanger,

- wherein said flow control means eliminates or reduces
20 the flow of said second medium to said second heat exchanger
when the engine load exceeds a predetermined load, and
increases the flow of said second medium to said second heat
exchanger when the engine load becomes the predetermined
load or lower; and

- 25 wherein said fuel injection timing control means

advances the fuel injection timing for a predetermined period of time during which the flow of said second medium to said second heat exchanger is shifted to a flow increase side from absence or a flow decrease side by said flow control means.

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6. The diesel engine according to Claim 5,
wherein said diesel engine comprises a water cooling type using cooling water;

wherein said first medium comprises outside air; and

10 wherein said second medium comprises said cooling water.

7. The diesel engine according to Claim 3, further comprising:

15 a supercharger for pressurizing intake outside air and supercharging it into said plurality of combustion chambers;

heat exchanging means constituted by including a first heat exchanger for receiving a first medium to exchange heat with charge air from an outlet of said supercharger, and a
20 second heat exchanger for receiving a second medium having a higher temperature than said first medium and exchanging heat with the charge air from an outlet of said first heat exchanger;
and

flow control means for controlling a flow of said second
25 medium flowing into said second heat exchanger,

wherein said flow control means eliminates or reduces the flow of said second medium to said second heat exchanger when the engine load exceeds a predetermined load, and increases the flow of said second medium to said second heat exchanger when the engine load becomes the predetermined load or lower; and

wherein said fuel injection timing control means advances the fuel injection timing for a predetermined period of time during which the flow of said second medium to said second heat exchanger is shifted to a flow increase side from absence or a flow decrease side by said flow control means.

8. The diesel engine according to Claim 7,
wherein said diesel engine comprises a water cooling type using cooling water;
wherein said first medium comprises outside air; and
wherein said second medium comprises said cooling water.

9. The diesel engine according to Claim 2,
wherein a fuel used comprises a water emulsion fuel.

10. The diesel engine according to Claim 9, further comprising:
a supercharger for pressurizing intake outside air and

supercharging it into at least one combustion chamber;

heat exchanging means constituted by including a first
heat exchanger for receiving a first medium to exchange heat
with charge air from an outlet of said supercharger, and a
5 second heat exchanger for receiving a second medium having a
higher temperature than said first medium and exchanging heat
with the charge air from an outlet of said first heat exchanger;
and

flow control means for controlling a flow of said second
10 medium flowing into said second heat exchanger,

wherein said flow control means eliminates or reduces
the flow of said second medium to said second heat exchanger
when the engine load exceeds a predetermined load, and
increases the flow of said second medium to said second heat
15 exchanger when the engine load becomes the predetermined
load or lower; and

wherein said fuel injection timing control means
advances the fuel injection timing for a predetermined period of
time during which the flow of said second medium to said
20 second heat exchanger is shifted to a flow increase side from
absence or a flow decrease side by said flow control means.

11. The diesel engine according to Claim 10,

wherein said diesel engine comprises a water cooling
25 type using cooling water;

wherein said first medium comprises outside air; and
wherein said second medium comprises said cooling
water.

5 12. The diesel engine according to Claim 2, further
comprising:

a supercharger for pressurizing intake outside air and
supercharging it into at least one combustion chamber;

heat exchanging means constituted by including a first
10 heat exchanger for receiving a first medium to exchange heat
with charge air from an outlet of said supercharger, and a
second heat exchanger for receiving a second medium having a
higher temperature than said first medium and exchanging heat
with the charge air from an outlet of said first heat exchanger;
15 and

flow control means for controlling a flow of said second
medium flowing into said second heat exchanger,

wherein said flow control means eliminates or reduces
the flow of said second medium to said second heat exchanger
20 when the engine load exceeds a predetermined load, and
increases the flow of said second medium to said second heat
exchanger when the engine load becomes the predetermined
load or lower; and

wherein said fuel injection timing control means
25 advances the fuel injection timing for a predetermined period of

time during which the flow of said second medium to said second heat exchanger is shifted to a flow increase side from absence or a flow decrease side by said flow control means.

- 5 13. The diesel engine according to Claim 12,
wherein said diesel engine comprises a water cooling
type using cooling water;
wherein said first medium comprises outside air; and
wherein said second medium comprises said cooling
10 water.

14. The diesel engine according to Claim 1, further
comprising:

- reduced cylinder operation control means for stopping
15 fuel supply to at least one combustion chamber being one part
out of a plurality of combustion chambers when the engine load
becomes a predetermined load or lower during said engine
stopping step.

- 20 15. The diesel engine according to Claim 14,
wherein a fuel used comprises a water emulsion fuel.

16. The diesel engine according to Claim 15, further
comprising:

- 25 a supercharger for pressurizing intake outside air and

supercharging it into said plurality of combustion chambers;

heat exchanging means constituted by including a first heat exchanger for receiving a first medium to exchange heat with charge air from an outlet of said supercharger, and a
5 second heat exchanger for receiving a second medium having a higher temperature than said first medium and exchanging heat with the charge air from an outlet of said first heat exchanger;
and

flow control means for controlling a flow of said second
10 medium flowing into said second heat exchanger,

wherein said flow control means eliminates or reduces the flow of said second medium to said second heat exchanger when the engine load exceeds a predetermined load, and increases the flow of said second medium to said second heat
15 exchanger when the engine load becomes the predetermined load or lower; and

wherein said fuel injection timing control means advances the fuel injection timing for a predetermined period of time during which the flow of said second medium to said
20 second heat exchanger is shifted to a flow increase side from absence or a flow decrease side by said flow control means.

17. The diesel engine according to Claim 16,

wherein said diesel engine comprises a water cooling
25 type using cooling water;

wherein said first medium comprises outside air; and
wherein said second medium comprises said cooling
water.

5 18. The diesel engine according to Claim 14, further
comprising:

a supercharger for pressurizing intake outside air and
supercharging it into said plurality of combustion chambers;

heat exchanging means constituted by including a first
10 heat exchanger for receiving a first medium to exchange heat
with charge air from an outlet of said supercharger, and a
second heat exchanger for receiving a second medium having a
higher temperature than said first medium and exchanging heat
with the charge air from an outlet of said first heat exchanger;
15 and

flow control means for controlling a flow of said second
medium flowing into said second heat exchanger,

wherein said flow control means eliminates or reduces
the flow of said second medium to said second heat exchanger
20 when the engine load exceeds a predetermined load, and
increases the flow of said second medium to said second heat
exchanger when the engine load becomes the predetermined
load or lower; and

wherein said fuel injection timing control means
25 advances the fuel injection timing for a predetermined period of

time during which the flow of said second medium to said second heat exchanger is shifted to a flow increase side from absence or a flow decrease side by said flow control means.

5 19. The diesel engine according to Claim 18,
wherein said diesel engine comprises a water cooling
type using cooling water;
wherein said first medium comprises outside air; and
wherein said second medium comprises said cooling
10 water.

20. The diesel engine according to Claim 1,
wherein a fuel used comprises a water emulsion fuel.

15 21. The diesel engine according to Claim 20, further
comprising:
a supercharger for pressurizing intake outside air and
supercharging it into at least one combustion chamber;
heat exchanging means constituted by including a first
20 heat exchanger for receiving a first medium to exchange heat
with charge air from an outlet of said supercharger, and a
second heat exchanger for receiving a second medium having a
higher temperature than said first medium and exchanging heat
with the charge air from an outlet of said first heat exchanger;
25 and

flow control means for controlling a flow of said second medium flowing into said second heat exchanger,

wherein said flow control means eliminates or reduces the flow of said second medium to said second heat exchanger
5 when the engine load exceeds a predetermined load, and increases the flow of said second medium to said second heat exchanger when the engine load becomes the predetermined load or lower; and

wherein said fuel injection timing control means
10 advances the fuel injection timing for a predetermined period of time during which the flow of said second medium to said second heat exchanger is shifted to a flow increase side from absence or a flow decrease side by said flow control means.

15 22. The diesel engine according to Claim 21,
wherein said diesel engine comprises a water cooling type using cooling water;

wherein said first medium comprises outside air; and
wherein said second medium comprises said cooling
20 water.

23. The diesel engine according to Claim 1, further comprising:

a supercharger for pressurizing intake outside air and
25 supercharging it into at least one combustion chamber;

heat exchanging means constituted by including a first heat exchanger for receiving a first medium to exchange heat with charge air from an outlet of said supercharger, and a second heat exchanger for receiving a second medium having a higher temperature than said first medium and exchanging heat with the charge air from an outlet of said first heat exchanger; and

flow control means for controlling a flow of said second medium flowing into said second heat exchanger,

wherein said flow control means eliminates or reduces the flow of said second medium to said second heat exchanger when the engine load exceeds a predetermined load, and increases the flow of said second medium to said second heat exchanger when the engine load becomes the predetermined load or lower; and

wherein said fuel injection timing control means advances the fuel injection timing for a predetermined period of time during which the flow of said second medium to said second heat exchanger is shifted to a flow increase side from absence or a flow decrease side by said flow control means.

24. The diesel engine according to Claim 23,

wherein said diesel engine comprises a water cooling type using cooling water;

wherein said first medium comprises outside air; and

wherein said second medium comprises said cooling
water.